American Refining Group, Inc. 77 N. Kendall Ave., Bradford, PA 16701

July 29, 2010

Mr. Adam Pesek
Department of Water Quality Protection
Pennsylvania Department of Environmental Protection
230 Chestnut Street
Meadville, PA 16335-3481

Reference: American Refining Group (ARG), Bradford
NPDES Permit Number PA0002647
Notification of Change for Chemical Additives

Dear Mr. Pesek:

The American Refining Group (ARG) is hereby notifying the Pennsylvania Department of Environmental Protection (PADEP) of its intent to add three water treatment chemicals, sodium hydroxide, phosphoric acid and Spectrfloc 675, to the refinery's current waste water chemical additive list. In accordance with ARG's NPDES permit, Part C Section II-Chemical Additives, a written notification must be submitted to the Department prior to chemical usage. Included is form 33800-PM-WSFR0008d, page 3. Also included are the material safety data sheets (MSDS) for each chemical.

If there are any questions, please contact me at 814-368-1223. Thank you for your assistance in this matter.

Sincerely,

American Refining Group, Inc.

Jason L. Goodling
Environmental Manager

Enclosures as noted.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

INDUSTRIAL WASTEWATER MODULE 1

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME	AMERICAN REFINING GROUP

1. Line Drawing. Attach a line drawing and water balance of flow through the facility. (See instructions)

2. OUTFALLS AND ASSOCIATED WASTEWATER TREATMENT TECHNOLOGIES

   Complete Module 2 identifying the treatment processes associated with each outfall.

3. SOURCES OF WASTEWATER

   Attach a separate Module 3 for every outfall.

   Indicate the number of Module 3s attached.

4. REQUIRED AND OPTIONAL ANALYSIS

   a. Summary of Required Analysis

Outfall Number	Discharge Contains (see Instructions)						Pollutants or Pollutant Groups which must be sampled for and analyzed	Required Number of Sample Events (see instructions)
	Process Waste	NCCW	Sanitary Waste	Misc. Waste	GW Cleanup	Stormwater		
002	☒	☐	☐	☐	☐	☐		
	☐	☐	☐	☐	☐	☐		
	☐	☐	☐	☐	☐	☐		
	☐	☐	☐	☐	☐	☐		
	☐	☐	☐	☐	☐	☐		
	☐	☐	☐	☐	☐	☐		

   b. Complete the modules for the Pollutant(s) or Pollutant Group(s) identified above. A separate module must be submitted for each process wastewater and combined (process wastewater and stormwater) outfall identified in the application. List the number of modules for each Pollutant Group submitted with this application.

_____ Module 4 - Pollutant Group 1

_____ Module 5 - Pollutant Group 2 - Metals

_____ Module 6 - Pollutant Group 3 - Volatile

_____ Module 7 - Pollutant Group 4 - Acids

_____ Module 8 - Pollutant Group 5 - Base/Neutral

Module 9 - Pollutant Group 6 - Pesticides

c. Optional Site-Specific Data

Additional modules may be attached to provide any of the optional site-specific information discussed in Appendix 2. (The modules should be used to report intake water quality, upstream background or ambient water quality, and parameter-specific coefficient of effluent variability. Space is provided at the top of the module to provide description of sampling points used.)

Optional data is attached to application. ☐ YES ☐ NO

5. PREPAREDNESS, PREVENTION, AND CONTINGENCY (PPC) PLANNING.

Does the facility have a PPC plan?

☒ YES ☐ NO

Does the facility have any other related plans, such as a Pollution Incident Prevention (PIP) Plan, Spill Prevention Control and Counter Measure (SPCC) Plan or BMP Plan?

☒ YES ☐ NO

If "YES," identify and indicate date(s) implemented.

Type of Plan	Date Implemented
ICP-encompasses SPCC, ICP, FRP	Updated July 2009

DEP may require the plan(s) be submitted with this application.

6. OTHER INFORMATION (OPTIONAL): Attach additional sheets describing any additional environmental pollution control programs which may affect the discharges which are underway or which are planned. Indicate whether each program is now underway or planned, and indicate the actual or planned schedules.

☐ MARK "X" IF DESCRIPTION OF ADDITIONAL INFORMATION IS ATTACHED

Applicant Name: AMERICAN REFINING GROUP

7. INFORMATION AND ANALYSIS OF EFFLUENT QUALITY FOR OTHER POTENTIALLY TOXIC POLLUTANTS

a. Information on Chemical Additives

(Read instructions carefully and use the tabular format to present the required information)

Outfall	Chemical Substance or Compound Trade Names or Specific Ingredients	Manufacturer Name and Address	Average & Maximum Usage Rate lbs/day	Concentration			Lowest Possible Analytical Detection Level (µg/L)	Whole Product 96 Hr LC50 (mg/L) and species(1)	Whole Product 48 Hr LC50 (mg/L) and species(1)
				In-system	Effluent	Units			
002	Caustic Soda	OxyChem	5	10	10	ppm	5	brook trout 25ppm/24hr king salmon 48 ppm	daphnia magna 100 ppm shrimp 33-100 ppm cockie 330 - 1000 ppm
002	Phosphoric Acid	OxyChem	0.5	1	1	ppm	5	mosquitofish 138 mg/l	
002	Spectrfloc 675	Baker hughes	5	10	10	ppm	2	Bluegill 2.5 mg/l Rainbow trout 0.94 mg/l fathead minnow 15.5 ppm 96	daphnia 0.12 mg/l daphnia pulex 1.7 ppm

(1) If LC50 Data for whole product is not available, data for the individual active ingredients may be provided.

b. Specific Substances which must be identified if Known or Expected to be Present

(Read instructions carefully and use the tabular format and additional pages, where necessary, to present the required information)

Outfall	Chemical Substance or Compound	Reason for Presence in Discharge	Average Effluent Concentration (µg/L)	Analytical Detection Level (µg/L)

c. Are any Table 2 substances identified for which a spill reporting exemption is requested? ☐ YES ☐ NO
If "YES," complete the Hazardous Substance Table.

d. Any other toxic chemicals known or expected to be present in the discharge.
Report any additional significant detections in effluent samples on the Other Toxic Chemicals sheets.

SAFETY DATA SHEET

OxyChem®

Responsible Care® Good Chemistry at Work

CAUSTIC SODA LIQUID (ALL GRADES)

MSDS No.: M32415 **Rev. Date:** 05/29/2009 **Rev. Num.:** 08

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Company Identification:	Occidental Chemical Corporation 5005 LBJ Freeway P.O. Box 809050 Dallas, Tx 75380-9050
24 Hour Emergency Telephone Number:	1-800-733-3665 or 1-972-404-3228 (U.S.); 32.3.575.55.55 (Europe); 1800-033-111 (Australia)
To Request an MSDS: **Customer Service:**	MSDS@oxy.com or 1-972-404-3245 1-800-752-5151 or 1-972-404-3700
Trade Name:	Caustic Soda Diaphragm Grade 10%, 15%, 18%, 20%, 25%, 30%, 35%, 40%, 50%, Caustic Soda Rayon Grade 18%, 20%, 25%, 30%, 50%, 50% Caustic Soda Rayon Grade OS, Caustic Soda Membrane 6%, 18%, 20%, 25%, 30%, 48%, 50%, 50% Caustic Soda Membrane OS, 50% Caustic Soda Diaphragm OS, Caustic Soda Low Salt 50%, 25% Caustic Soda Purified, 50% Caustic Soda Purified, 50% Caustic Soda Purified OS, Caustic Soda Liquid 70/30, Membrane Blended, 50% Caustic Soda Membrane (Northeast), 50% Caustic Soda Diaphragm (West Coast), 50% Blended Rayon Grade Blended, Membrane Cell Liquor
Synonyms:	Sodium hydroxide solution, Liquid Caustic, Lye Solution, Caustic, Lye, Soda Lye
Product Use:	Metal finishing, Cleaner, Process chemical, Petroleum industry

2. HAZARDS IDENTIFICATION

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EMERGENCY OVERVIEW:

Color:	Colorless to slightly colored
Physical State:	Liquid
Odor:	Odorless
Signal Word:	Danger

MAJOR HEALTH HAZARDS: CORROSIVE. CAUSES BURNS TO THE RESPIRATORY TRACT, SKIN, EYES AND GASTROINTESTINAL TRACT. CAUSES PERMANENT EYE DAMAGE.
PHYSICAL HAZARDS: CORROSIVE. Mixing with water, acid or incompatible materials may cause splattering and release of heat.
ECOLOGICAL HAZARDS: Keep out of water supplies and sewers. This material is alkaline and may raise the pH of surface waters. This material has exhibited moderate toxicity to aquatic organisms.
PRECAUTIONARY STATEMENTS: Avoid breathing vapors or mist. Avoid contact with skin, eyes and clothing. Keep container tightly closed. Wash thoroughly after handling. Use only with adequate ventilation.
****

POTENTIAL HEALTH EFFECTS:

Inhalation: May cause irritation (possibly severe), chemical burns, and pulmonary edema.

Skin contact: May cause irritation (possibly severe) and chemical burns.

Eye contact: May cause irritation (possibly severe), chemical burns, eye damage, and blindness.

Ingestion: May cause irritation (possibly severe), chemical burns, nausea, and vomiting.

Target Organs Effected: Respiratory System, Skin, Eye

Medical Conditions Aggravated by Exposure: Asthma, Respiratory disorders

See Section 11: TOXICOLOGICAL INFORMATION

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Component	Concentration (by weight %)	CAS - No.
Water	48.5 - 94.5	7732-18-5
Sodium hydroxide	5.5 - 51.5	1310-73-2
Sodium chloride (NaCl)	1 - 5	7647-14-5

4. FIRST AID MEASURES

Inhalation: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. If respiration or pulse has stopped, have a trained person administer basic life support (Cardio-Pulmonary Resuscitation/Automatic External Defibrillator) and CALL FOR EMERGENCY SERVICES IMMEDIATELY.

Skin Contact: Immediately flush contaminated areas with water. Remove contaminated clothing, jewelry, and shoes immediately. Wash contaminated areas with soap and water. Thoroughly clean and dry contaminated clothing before reuse. Discard contaminated leather goods. GET MEDICAL ATTENTION IMMEDIATELY.

4. FIRST AID MEASURES

Eye Contact: Immediately flush eyes with a directed stream of water for at least 15 minutes, forcibly holding eyelids apart to ensure complete irrigation of all eye and lid tissues. Washing eyes within several seconds is essential to achieve maximum effectiveness. GET MEDICAL ATTENTION IMMEDIATELY.

Ingestion: Never give anything by mouth to an unconscious or convulsive person. If swallowed, do not induce vomiting. Give large amounts of water. If vomiting occurs spontaneously, keep airway clear. Give more water when vomiting stops. GET MEDICAL ATTENTION IMMEDIATELY.

Notes to Physician: The absence of visible signs or symptoms of burns does NOT reliably exclude the presence of actual tissue damage. Probable mucosal damage may contraindicate the use of gastric lavage.

5. FIRE-FIGHTING MEASURES

Fire Hazard: Negligible fire hazard.

Extinguishing Media: Use media appropriate for surrounding fire

Fire Fighting: Move container from fire area if it can be done without risk. Cool containers with water. Avoid contact with skin.

Sensitivity to Mechanical Impact: Not sensitive.

Sensitivity to Static Discharge: Not sensitive.

Flash point: Not flammable

6. ACCIDENTAL RELEASE MEASURES

Occupational Release:
Wear appropriate personal protective equipment recommended in Section 8 of the MSDS. Completely contain spilled material with dikes, sandbags, etc. Shovel dry material into suitable container. Liquid material may be removed with a vacuum truck. Remaining material may be diluted with water and neutralized with dilute acid, then absorbed and collected. Flush spill area with water, if appropriate. Keep product and flush water out of water supplies and sewers. This material is alkaline and may raise the pH of surface waters with low buffering capacity. Releases should be reported, if required, to appropriate agencies.

7. HANDLING AND STORAGE

Storage Conditions: Store and handle in accordance with all current regulations and standards. Keep container tightly closed and properly labeled. Do not store in aluminum container or use aluminum fittings or transfer lines, as flammable hydrogen gas may be generated. Keep separated from incompatible substances.

7. HANDLING AND STORAGE

Handling Procedures: Avoid breathing vapor or mist. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling. When mixing, slowly add to water to minimize heat generation and spattering.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

OSHA Regulatory Exposure limit(s):

Hazardous Component	CAS - No.	OSHA Final PEL TWA	OSHA Final PEL STEL	OSHA Final PEL Ceiling
Sodium hydroxide	1310-73-2	2 mg/m^3	-----	-----

Non-Regulatory Exposure Limit(s):
The Non-Regulatory OSHA limits shown in the table are the Vacated 1989 PEL's (vacated by 58 FR 35338, June 30, 1993).

Hazardous Component	CAS - No.	ACGIH TWA	ACGIH STEL	ACGIH Ceiling	OSHA TWA (Vacated)	OSHA STEL (Vacated)	OSHA Ceiling (Vacated)
Sodium hydroxide	1310-73-2	-----	-----	2 mg/m^3	-----	-----	2 mg/m^3

ENGINEERING CONTROLS: Provide local exhaust ventilation where dust or mist may be generated. Ensure compliance with applicable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Eye Protection: Wear chemical safety goggles with a faceshield to protect against eye and skin contact when appropriate. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Skin and Body Protection: Wear chemical resistant clothing and rubber boots when potential for contact with the material exists. Contaminated clothing should be removed, then discarded or laundered.

Hand Protection: Wear appropriate chemical resistant gloves

Protective Material Types: Natural rubber, Neoprene, Nitrile

Hazardous Component	Immediately Dangerous to Life/ Health (IDLH)
Sodium hydroxide	10 mg/m^3 IDLH

Respiratory Protection: A NIOSH approved respirator with N95 (dust, fume, mist) cartridges may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits, or when symptoms have been observed that are indicative of overexposure. If eye irritation occurs, a full face style mask should be used. A respiratory protection program that meets 29 CFR 1910.134 must be followed whenever workplace conditions warrant use of a respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Appearance:	Clear to opaque
Color:	Colorless to slightly colored
Odor:	Odorless
Boiling Point/Range:	230 – 291 F (110 – 144 C)

9. PHYSICAL AND CHEMICAL PROPERTIES

Freezing Point/Range:	-26 to 59 F (-32 to 15 C)
Vapor Pressure:	13 - 135 mmHg @ 60 C
Vapor Density (air=1):	No data available
Specific Gravity (water=1):	1.11 – 1.53 @ 15.6 C
Water Solubility:	100%
pH:	14.0 (7.5% solution)
Volatility:	No data available
Evaporation Rate (ether=1):	No data available
Partition Coefficient (n-octanol/water):	No data available

10. STABILITY AND REACTIVITY

Reactivity/ Stability:	Stable at normal temperatures and pressures.
Conditions to Avoid:	Mixing with water, acid or incompatible materials may cause splattering and release of large amounts of heat. Will react with some metals forming flammable hydrogen gas. Carbon monoxide gas may form upon contact with reducing sugars, food and beverage products in enclosed spaces.
Incompatibilities/ Materials to Avoid:	Acids, Halogenated compounds, Prolonged contact with aluminum, brass, bronze, copper, lead, tin, zinc or other alkali sensitive metals or alloys
Hazardous Decomposition Products:	Toxic fumes of sodium oxide
Hazardous Polymerization:	Will not occur

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA:

Hazardous Component	LD50 Oral	LC50 Inhalation	LD50 Dermal
Sodium hydroxide	Not listed	Not listed	1350 mg/kg (Rabbit)
Sodium chloride (NaCl)	3 g/kg (Rat)	42 g/m^3 (1 hr-Rat)	10 g/kg (Rabbit)

TOXICITY:
The severity of the tissue damage is a function of its concentration, the length of tissue contact time, and local tissue conditions. After exposure there may be a time delay before irritation and other effects occur. This material is a strong irritant and is corrosive to the skin, eyes, and mucous membranes. This material may cause severe burns and permanent damage to any tissue with which it comes into contact. Inhalation will cause severe irritation, possible burns with pulmonary edema, which may lead to pneumonitis. Skin contact with this material may cause severe irritation and corrosion of tissue. Repeated exposure may cause dermatitis. Eye contact can cause severe irritation, corrosion with possible corneal damage and blindness. Ingestion may cause irritation, corrosion/ulceration, nausea, and vomiting.

CARCINOGENICITY: This product is not classified as a carcinogen by NTP, IARC or OSHA.

12. ECOLOGICAL INFORMATION

AQUATIC TOXICITY: This material has exhibited moderate toxicity to aquatic organisms. Data provided are for sodium hydroxide.

Freshwater Fish Data:
LC50 brook trout: 25 ppm/24 hr
LC50 king salmon: 48 ppm
Invertebrate Toxicity Data:
EC50 daphnia magna: 100 ppm
EC50 shrimp: 33 – 100 ppm/48 hr
EC50 cockle: 330 – 1000 ppm/48 hr

BIODEGRADATION: This material is inorganic and not subject to biodegradation.

PERSISTENCE: This material is alkaline and may raise the pH of surface waters with low buffering capacity. This material is believed to exist in the disassociated state in the environment.

BIOCONCENTRATION: This material is not expected to bioconcentrate in organisms.

ADDITIONAL ECOLOGICAL INFORMATION: This material has exhibited slight toxicity to terrestrial organisms.

13. DISPOSAL CONSIDERATIONS

Reuse or reprocess, if possible. Dispose in accordance with all applicable regulations. May be subject to disposal regulations: U.S. EPA 40 CFR 261. Hazardous Waste Number(s): D002

14. TRANSPORT INFORMATION

U.S.DOT 49 CFR 172.101:

PROPER SHIPPING NAME:	Sodium Hydroxide Solution
DOT UN NUMBER:	UN1824
HAZARD CLASS/ DIVISION:	8
PACKING GROUP:	II
LABELING REQUIREMENTS:	8
DOT RQ (lbs):	RQ 1000 lbs. (Sodium Hydroxide)

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

SHIPPING NAME:	Sodium hydroxide solution
UN NUMBER:	UN1824
CLASS:	8
PACKING/RISK GROUP:	II

15. REGULATORY INFORMATION

U.S. REGULATIONS

- **OSHA REGULATORY STATUS:**
  This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200) (US).

- **CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):**
  If a release is reportable under CERCLA section 103, notify the state emergency response commission and local emergency planning committee. In addition, notify the National Response Center at (800) 424-8802 or (202) 426-2675.

Hazardous Component	CERCLA Reportable Quantities:
Sodium hydroxide	1000 lb (final RQ)

- **EPCRA EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30):** No components are listed.

- **EPCRA SECTIONS 311/312 HAZARD CATEGORIES (40 CFR 370.21):**
  Acute Health Hazard

- **EPCRA SECTION 313 (40 CFR 372.65):** No components are listed.

- **OSHA PROCESS SAFETY (29 CFR 1910.119):** Not regulated

NATIONAL INVENTORY STATUS

- **U.S. INVENTORY STATUS (TSCA):** All components are listed or exempt

- **TSCA 12(b):** This product is not subject to export notification

CANADIAN DOMESTIC SUBSTANCE LIST (DSL/NDSL): All components are listed.

STATE REGULATIONS

California Proposition 65: This product is not listed, but it may contain contaminants known to the State of California to cause cancer or reproductive toxicity as listed under Proposition 65 State Drinking Water and Toxic Enforcement Act. For additional information, contact OxyChem Customer Service.

Hazardous Component	Sodium hydroxide
California Proposition 65 Cancer WARNING:	Not Listed
California Proposition 65 CRT List - Male reproductive toxin:	Not Listed
California Proposition 65 CRT List - Female reproductive toxin:	Not Listed
Massachusetts Right to Know Hazardous Substance List	Listed
New Jersey Right to Know Hazardous Substance List	Listed
New Jersey Special Health Hazards Substance List	Listed
Pennsylvania Right to Know Hazardous Substance List	Listed
Pennsylvania Right to Know Environmental Hazard List	Listed
Rhode Island Right to Know Hazardous Substance List	Listed

CANADIAN REGULATIONS:
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

WHMIS Classification:	E

16. OTHER INFORMATION

Prepared by: OxyChem Corporate HESS - Health Risk Management

HMIS: (SCALE 0-4) (Rated using National Paint & Coatings Association HMIS: Rating Instructions, 2nd Edition)
Health: 3 **Flammability:** 0 **Reactivity:** 1
NFPA 704 - Hazard Identification Ratings (SCALE 0-4)
Health: 3 **Flammability:** 0 **Reactivity:** 1

Reason for Revision:
1. Removed Chronic Toxicity: SEE SECTION 11

IMPORTANT:
The information presented herein, while not guaranteed, was prepared by technical personnel and is true and accurate to the best of our knowledge. NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, OR WARRANTY OR GUARANTY OF ANY OTHER KIND, EXPRESS OR IMPLIED, IS MADE REGARDING PERFORMANCE, SAFETY, SUITABILITY, STABILITY OR OTHERWISE. This information is not intended to be all-inclusive as to the manner and conditions of use, handling, storage, disposal and other factors that may involve other or additional legal, environmental, safety or performance considerations, and OxyChem assumes no liability whatsoever for the use of or reliance upon this information. While our technical personnel will be happy to respond to questions, safe handling and use of the product remains the responsibility of the customer. No suggestions for use are intended as, and nothing herein shall be construed as, a recommendation to infringe any existing patents or to violate any Federal, State, local or foreign laws.

Standard 29 CFR 1910.1200 requires that information be provided to employees regarding the hazards of chemicals by means of a hazard communication program including labeling, material safety data sheets, training and access to written records. We request that you, and it is your legal duty to, make all information in this Material Safety Data Sheet available to your employees.

PHOSPHORIC ACID 75%, 80% & 85%

Date Prepared: 23 Jan 09

1. PRODUCT AND COMPANY DESCRIPTION

Emergency Phone Numbers:
FOR EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT CONTACT: CHEMTREC (800-424-9300 within the United States or 703-527-3887 for international collect calls)

Chemical Name or Synonym	ORTHOPHOSPHORIC ACID; WHITE PHOSPHORIC ACID
Molecular Formula	H_3PO_4

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS Reg Number	OSHA Hazard	Percentage
PHOSPHORIC ACID	7664-38-2	Y	75 - 85
WATER	7732-18-5	N	BALANCE

3. HAZARDS IDENTIFICATION

A. EMERGENCY OVERVIEW

Physical Appearance and Odor	colorless liquid, odorless
Warning Statements	DANGER! CAUSES BURNS

B. POTENTIAL HEALTH EFFECTS:

Acute Eye	Corrosive. Causes tissue destruction, permanent damage to the cornea, blindness
Acute Skin	Causes irritation, burns
Acute Inhalation	Mists may cause lung irritation, shortness of breath, fluid in lungs
Acute Ingestion	Can cause nausea, vomiting, diarrhea, corrosion, burns to mouth and esophagus, abdominal pain, chest pain, shortness of breath, seizures, death
Chronic Effects	This product does not contain any ingredient designated by IARC, NTP, ACGIH or OSHA as probable or suspected human carcinogens

4. FIRST AID MEASURES

Eye Exposure	Hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes. Seek immediate medical attention, preferably with an ophthalmologist. If the physician is not immediately available, eye irrigation should be continued for an additional 15 minutes. If it is necessary to transport the patient to a physician and the eye needs to be bandaged, use a dry sterile cloth pad and cover both eyes
Skin Exposure	Immediately wipe excess material off skin with a dry cloth; then wash skin with plenty of soap and water for at least 15 minutes. Seek medical attention. Remove contaminated clothing and shoes while washing. Clean contaminated clothing and shoes before re-use or discard if they cannot be thoroughly cleaned
Inhalation	Remove victim from immediate source of exposure and assure that the victim is

	breathing. If breathing is difficult, administer oxygen, if available. If victim is not breathing, administer CPR (cardio-pulmonary resuscitation). Seek immediate medical attention
Ingestion	If victim is conscious and alert, give 2-3 glasses of water to drink and do not induce vomiting. Seek immediate medical attention. Do not leave victim unattended. To prevent aspiration of swallowed product, lay victim on side with head lower than waist. Vomiting may occur spontaneously. If vomiting occurs and the victim is conscious, give water to further dilute the chemical

MEDICAL CONDITIONS POSSIBLY AGGRAVATED BY EXPOSURE:

Inhalation of product may aggravate existing chronic respiratory problems such as asthma, emphysema or bronchitis. Skin contact may aggravate existing skin disease.

NOTES TO PHYSICIAN:

All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

This material is an acid. The primary toxicity of this product is due to its irritant effects on mucous membranes.

INHALATION	If cough or shortness of breath occurs, evaluate the possibility of bronchitis or pneumonitis. Chest x-ray and arterial blood gases can be used to determine the presence of pulmonary edema. In severe cases, use of humidified oxygen and assisted ventilation including positive end expiratory pressure (PEEP) may be needed. Parenteral steroids may be useful in limiting the extent of pulmonary damage
SKIN	Wash exposed area thoroughly with soap and water. Chemical burns from strong acids are generally treated the same as thermal burns
EYES	Irrigate eyes for 15 minutes with sterile saline. If irritation, pain, swelling, photophobia or lacrimation persist, examination by an ophthalmologist is recommended
INGESTION	If not already performed by first aid personnel, irrigate mouth with large amounts of water and dilute the acid by having victim drink 4 to 8 ounces of water or milk. DO NOT induce vomiting. Use of gastric lavage is controversial. The advantage of removal of acid must be weighted against the risk of perforation or bleeding. If a large amount of acid (> 1 ml/kg body weight) has been recently ingested, cautious gastric lavage is generally advised if the patient is alert and there is little risk of convulsions. Consultation with a gastroenterologist and/or surgeon is advised. Serious complications such as perforation or stricture of the esophagus may occur requiring care by specialists. Laryngeal edema may develop requiring intubation or tracheostomy

5. FIRE FIGHTING MEASURES

Flash Point	Not Applicable
Extinguishing Media	Not combustible. Use extinguishing method suitable for surrounding fire
Special Fire Fighting Procedures	Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing. Keep unnecessary people away, isolate hazard area and deny entry. Evacuate

	residents who are downwind of fire. Dike area to prevent runoff and contamination of water sources. Dispose of fire control water later. Persons who may have been exposed to contaminated smoke should be immediately examined by a physician and checked for symptoms of poisoning. The symptoms should not be mistaken for heat exhaustion or smoke inhalation
Unusual Fire and Explosion Hazards	Not combustible
Hazardous Decomposition Materials (Under Fire Conditions)	oxides of phosphorus

6. ACCIDENTAL RELEASE MEASURES

Evacuation Procedures and Safety	Wear appropriate protective gear for the situation. See Personal Protection information in Section 8
Containment of Spill	Dike or retain dilution water or water from firefighting for later disposal. Follow procedure described below under Cleanup and Disposal of Spill
Cleanup and Disposal of Spill	Exercise caution during neutralization as considerable heat may be generated. Carefully neutralize spill with soda ash. Clean up residual material by washing area with water
Environmental and Regulatory Reporting	Runoff from fire control or dilution water may cause pollution. Large spills should be handled according to a predetermined plan. For assistance in developing a plan contact the Technical Service Department using the Product Information phone number in Section 1

7. HANDLING AND STORAGE

Minimum/Maximum Storage Temperatures	Not Available
Handling	Do not get on skin or in eyes. Avoid breathing vapors and mists. Do not ingest. This product reacts violently with bases liberating heat and causing spattering
Storage	Store in an area that is cool, dry, well-ventilated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Introductory Remarks:

These recommendations provide general guidance for handling this product. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. While developing safe handling procedures, do not overlook the need to clean equipment and piping systems for maintenance and repairs. Waste resulting from these procedures should be handled in accordance with Section 13: Disposal Considerations.

Assistance with selection, use and maintenance of worker protection equipment is generally available from equipment manufacturers.

Exposure Guidelines:

Exposure limits represent regulated or recommended worker breathing zone concentrations measured by validated sampling and analytical methods, meeting the regulatory requirements. The following limits apply to this material, where, if indicated, S=skin and C=ceiling limit:

	TWA	STEL
ACGIH	1 mg/cu m	3 mg/cu m
OSHA	1 mg/cu m	3 mg/cu m

Engineering Controls:

Where engineering controls are indicated by use conditions or a potential for excessive exposure exists, the following traditional exposure control techniques may be used to effectively minimize employee exposures: local exhaust ventilation at the point of generation.

Respiratory Protection:

When respirators are required, select NIOSH/MSHA approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industrial recommendations.

Eye/Face Protection:

Eye and face protection requirements will vary dependent upon work environment conditions and material handling practices. Appropriate ANSI Z87 approved equipment should be selected for the particular use intended for this material.
Eye contact should be prevented through use of chemical safety glasses with side shields or splash proof goggles. An emergency eye wash must be readily accessible to the work area. Face contact should be prevented through use of a face shield.

Skin Protection:

Skin contact should be prevented through use of suitable protective clothing, gloves and footwear, selected with regard for use conditions and exposure potential. Consideration must be given both to durability as well as permeation resistance.

Work Practice Controls:

Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material:
(1) Do not store, use, and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored.
(2) Wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics, or using the toilet.
(3) Wash exposed skin promptly to remove accidental splashes or contact with this material.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical properties here represent typical properties of this product. Contact the business area using the Product Information phone number in Section 1 for its exact specifications.

Physical Appearance	colorless /liquid
Odor	odorless
pH	< 1 at 1 wt/wt%.
Specific Gravity	> 1.573 at 25 C (77 F).
Density	1.573 to 1.693 g/ml at 25 C (77 F).
Water Solubility	miscible
Melting Point Range	Not Available

Freezing Point Range	-17 to 21 C (1 to 70 F)
Boiling Point Range	135 to 158 C (275 to 316 F) at 760 mmHg
Vapor Pressure	5.65 to 2.16 mmHg at 20 C (68 F)
Vapor Density	Not Available

10. STABILITY AND REACTIVITY

Chemical Stability	This material is stable under normal handling and storage conditions described in Section 7
Conditions To Be Avoided	none known
Materials/Chemicals To Be Avoided	fluorine; strong oxidizing agents; strong reducing agents; bases; metals; sulfur trioxide; phosphorus pentoxide
The Following Hazardous Decomposition Products Might Be Expected	
Decomposition Type	thermal oxides of phosphorus
Hazardous Polymerization	Will Not Occur
Avoid The Following To Inhibit Hazardous Polymerization	not applicable

11. TOXICOLOGICAL INFORMATION

	Toxicological Information and Interpretation
Acute Eye Irritation	eye - eye irritation, 119 mg, rabbit. Severely irritating. eye - eye irritation, rabbit. Corrosive
Acute Skin Irritation	skin - skin irritation, 595 mg/24 hr, rabbit. Severely irritating. skin - skin irritation, rabbit. Corrosive. (At 24 hours.).
Acute Dermal Toxicity	LD50 - lethal dose 50% of test species, 2740 mg/kg, rabbit
Acute Respiratory Irritation	No test data found for product
Acute Inhalation Toxicity	No test data found for product
Acute Oral Toxicity	LD50 - lethal dose 50% of test species, 1530 mg/kg, rat
Chronic Toxicity	This product does not contain any substances that are considered by OSHA, NTP, IARC or ACGIH to be "probable" or "suspected" human carcinogens

No additional test data found for product.

12. ECOLOGICAL INFORMATION

Ecotoxicological information:

LC50 - lethal concentration 50% of test species, 138 mg/l/96 hr, fish: Mosquitofish. Practically nontoxic.

Chemical Fate Information:

No specific biodegradation test data located. While acidity of this material is readily reduced in natural waters, the resulting phosphate may persist indefinitely or incorporate into biological systems.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method	Please contact technical service support at the phone number in section one of this MSDS to obtain suggestions for proper disposal of this product. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from federal laws and regulations. Consult state and local regulations regarding the proper disposal of this material
EPA Hazardous Waste	YES
EPA RCRA HAZARDOUS WASTE CODES	"C" Corrosive

14. TRANSPORTATION INFORMATION

IMPORTANT! Statements below provide additional data on listed DOT classification.
The listed Transportation Classification does not address regulatory variations due to changes in package size, mode of shipment or other regulatory descriptors .

US Department of Transportation

Hazard Class	8
Shipping Name	PHOSPHORIC ACID SOLUTION
ID Number	UN1805
Packing Group	III
Labels	CORROSIVE
Emergency Guide #	154

15. REGULATORY INFORMATION

Inventory Status

Inventory	Status
UNITED STATES (TSCA)	Y
CANADA (DSL)	Y
EUROPE (EINECS/ELINCS)	Y
AUSTRALIA (AICS)	Y
JAPAN (MITI)	Y
SOUTH KOREA (KECL)	Y

Y = All ingredients are on the inventory.
E = All ingredients are on the inventory or exempt from listing.

P = One or more ingredients fall under the polymer exemption or are on the no longer polymer list. All other ingredients are on the inventory or exempt from listing.
N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing.

FEDERAL REGULATIONS

Inventory Issues	All functional components of this product are listed on the TSCA Inventory
SARA Title III Hazard Classes	
Fire Hazard	NO
Reactive Hazard	NO
Release of Pressure	NO
Acute Health Hazard	YES
Chronic Health Hazard	NO

SARA Extremely Hazardous Substances (EHS)/CERCLA Hazardous Substances

Ingredient	CERCLA/SARA RQ	SARA EHS TPQ
PHOSPHORIC ACID	5000 lbs	

OTHER FEDERAL REGULATIONS:

FDA Status: This product meets the compositional requirements of 21 CFR 182.1073 PHOSPHORIC ACID

STATE REGULATIONS:

This product does not contain any components that are regulated under California Proposition 65.

16. OTHER INFORMATION

National Fire Protection Association Hazard Ratings--NFPA(R):

3	Health Hazard Rating--Serious
0	Flammability Rating--Minimal
0	Instability Rating--Minimal

National Paint & Coating Hazardous Materials Identification System--HMIS(R):

3	Health Hazard Rating--Serious
0	Flammability Rating--Minimal
0	Reactivity Rating--Minimal

Key Legend Information:

ACGI~ - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
TLV - Threshold Limit Value
PEL - Permissible Exposure Limit
TWA - Time Weighted Average
STEL - Short Term Exposure Limit
NTP - National Toxicology Program
IARC - International Agency for Research on Cancer
ND - Not determined
RPI - INNOPHOS Established Exposure Limits

Disclaimer:

The information herein is given in good faith but no warranty, expressed or implied, is made.

Material Safety Data Sheet

1 . Product and company identification

Product name : SpectraFloc™ 675 FLOCCULANT
™ a trademark of Baker Hughes, Inc.

Supplier : Baker Petrolite
A Baker Hughes Company
12645 W. Airport Blvd.
Sugar Land, TX 77478
For Product Information/MSDSs Call: 800-231-3606
(8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400

Material Uses : Special: Cationic Emulsion Polymer

Code : SPC675

Validation date : 12/30/2009.

Print date : 12/30/2009.

Version : 6

Responsible name : Global Regulatory Affairs - Telephone 281-276-5400 or 800-231-3606

In case of emergency : CHEMTREC: 800-424-9300 (U.S. 24 hour)
Baker Petrolite: 800-231-3606
(001)281-276-5400
CANUTEC: 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

2 . Hazards identification

Physical state : Liquid.

Odor : Hydrocarbon. [Slight]

Color : Opaque.

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Emergency overview : WARNING!

INHALATION CAUSES HEADACHES, DIZZINESS, DROWSINESS AND NAUSEA AND MAY LEAD TO UNCONSCIOUSNESS. CAUSES RESPIRATORY TRACT AND EYE IRRITATION. MAY CAUSE SKIN IRRITATION. PROLONGED OR REPEATED CONTACT MAY DRY SKIN AND CAUSE IRRITATION. HARMFUL OR FATAL IF SWALLOWED. CAN ENTER LUNGS AND CAUSE DAMAGE. SUSPECT CANCER HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE CANCER. ASPIRATION HAZARD.

Do not breathe vapor or mist. Do not ingest. Avoid contact with eyes, skin and clothing. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.

Routes of entry : Dermal contact. Eye contact. Inhalation.

Potential acute health effects

Inhalation : Can cause central nervous system (CNS) depression. Irritating to respiratory system.

Ingestion : Can cause central nervous system (CNS) depression. Aspiration hazard if swallowed. Can enter lungs and cause damage.

Skin : Moderately irritating to the skin.

Eyes : Irritating to eyes.

Potential chronic health effects

Chronic effects : Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis.

Carcinogenicity : Contains material which may cause cancer. Risk of cancer depends on duration and level of exposure.

Over-exposure signs/symptoms

2 . Hazards identification

Inhalation : respiratory tract irritation, nausea or vomiting, coughing, headache, drowsiness/fatigue, dizziness/vertigo, unconsciousness

Ingestion : nausea or vomiting

Skin : irritation, redness, dryness, cracking

Eyes : pain or irritation, watering, redness

See toxicological information (section 11)

3 . Composition/information on ingredients

Name	CAS number	%
Cationic acrylamide copolymer	Trade secret.	30 - 60
Petroleum distillates	64742-47-8	10 - 30
Carboxylic acid	Trade secret.	1 - 5
Ethoxylated alcohol	Trade secret.	1 - 5
Acrylamide	79-06-1	0 - 0.1

4 . First aid measures

Eye contact : Get medical attention immediately. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wear suitable protective clothing and gloves. Remove contaminated clothing and shoes.

Additional information

If product is ingested and vomiting occurs naturally, have person lean forward to reduce the risk of aspiration into the lungs.

5 . Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

Suitable : Use an extinguishing agent suitable for the surrounding fire.

Not suitable : None known.

Special exposure hazards : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Hazardous thermal decomposition products : carbon dioxide,carbon monoxide,nitrogen oxides,halogenated compounds

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6 . Accidental release measures

Personal precautions : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Methods for cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Absorb with an inert material. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

If RQ (Reportable Quantity) is exceeded, report to National Spill Response Office at 1-800-424-8802.

7 . Handling and storage

Handling : Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage : Store in accordance with local regulations. Store in a dry, cool and well-ventilated area, away from incompatible materials (see section 10). Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

Occupational exposure limits		TWA (8 hours)			STEL (15 mins)			Ceiling			
Ingredients:	**List name**	**ppm**	**mg/m³**	**Other**	**ppm**	**mg/m³**	**Other**	**ppm**	**mg/m³**	**Other**	**Notations**
Petroleum distillates	US ACGIH	-	200	-	-	-	-	-	-	-	[1]
Acrylamide	US ACGIH	-	0.03	-	-	-	-	-	-	-	[1]
	OSHA PEL	-	0.3	-	-	-	-	-	-	-	[1]
	OSHA PEL 1989	-	0.03	-	-	-	-	-	-	-	[1]

[1]Absorbed through skin.

Consult local authorities for acceptable exposure limits.

Only components of this product with established exposure limits appear in the box above.

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

8 . Exposure controls/personal protection

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstation location. Take off contaminated clothing and wash before re-use.

Personal protection

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands : Chemical-resistant gloves: Butyl rubber gloves. Nitrile gloves.

Eyes : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

Skin : Wear long sleeves and other protective clothing to prevent repeated or prolonged skin contact.

9 . Physical and chemical properties

Physical state : Liquid.

Flash point : Closed cup: >93.4°C (>200.1°F) [PMCC]

Auto-ignition temperature : Not available.

Flammable limits : Not available.

Color : Opaque.

Odor : Hydrocarbon. [Slight]

pH : 4 to 6

: 5% in water

Boiling/condensation point : 149 to 177°C (300.2 to 350.6°F)

Initial Boiling Point : Not available.

Melting/freezing point : Not available.

Relative density : 1 (15.6°C)

Density : 8.33 (lbs/gal)

Vapor density : >1 [Air = 1]

Odor threshold : Not available.

Evaporation rate : Not available.

VOC : Not available.

Viscosity : Not available.

Solubility (Water) : Soluble

Vapor pressure : Not available.

Pour Point : -18°C (-0.4°F)

Partition coefficient (LogKow) : Not available.

10 . Stability and Reactivity

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Conditions to avoid : Avoid exposure - obtain special instructions before use. Do not swallow.

Materials to avoid : Reactive or incompatible with the following materials: oxidizing materials.
Do not use iron, copper, or aluminum for transportation, handling, or storage.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

10 . Stability and Reactivity

Conditions of reactivity : Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.

11 . Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Acrylamide	LD50 Dermal	Rabbit	1870 mg/kg	-
	LD50 Dermal	Rabbit	1150 mg/kg	-
	LD50 Dermal	Rat	400 mg/kg	-
	LD50 Dermal	Rabbit	1680 uL/kg	-
	LD50 Oral	Rabbit	150 mg/kg	-
	LD50 Oral	Rat	124 mg/kg	-

Carcinogenicity

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
Petroleum distillates	A3	-	-	-	-	-
Acrylamide	A3	2A	-	+	Possible	None.

Chronic toxicity Remarks

1) Cationic acrylamide copolymer

Not available.

2) Petroleum distillates

These petroleum distillates may cause slight irritation of the eyes. Repeated or prolonged skin contact with the liquid may cause irritation, reddening, and dermatitis. Inhalation of high vapor concentrations may cause headaches, stupor, irritation of the throat, central nervous system depression, and kidney effects. Extreme aspiration into the lungs may cause chemical pneumonia or death. Low order of oral toxicity. Ingestion can cause irritation of the stomach and intestines which can produce nausea and vomiting. Vomiting should be avoided since aspiration of ingested material into the lungs may produce chemical pneumonia.

3) Carboxylic acid

Not available.

4) Ethoxylated alcohol

Not available.

5) Acrylamide

Acrylamide is a component of this product. The major effects of chronic acrylamide exposure are on the nervous system. Exposure to acrylamide for a few days or weeks can produce lassitude (weariness), drowsiness, sleepiness, loss of concentration, nervousness, irritability, loss of body coordination, speech and language disturbances, jerking of the eye, and urinary retention (ACGIH, 1991). Peripheral neuropathy with primarily motor and proprioceptive disturbances (interruptions in the ability of the muscles, tendons, and other internal tissue to receive stimuli), may follow 2 to 3 weeks later (Igisu et al, 1975).

In chronic low-dose exposure, effects are predominantly sensorimotor (mixed bed fibers containing sensory and motor nerves) and proprioceptive neuropathies (interruptions in the nerves ability to receive stimuli) with loss of deep tendon reflexes, muscle weakness and wasting, distal extremity numbness, paresthesias (abnormal burning, pricking, tickling or tingling), foot drop, and persistent ataxia (Auld & Bedwell, 1967; Garland & Patterson, 1967; Fullerton, 1969; Satchell & McLeod, 1981). In severe cases, residual ataxia, loss of reflexes, distal extremity weakness, and sensory disturbances may remain (Donovan & Pearson, 1987; Fullerton, 1969). Persons exposed for more than 22 weeks showed little recovery in peripheral neural function (outer neurons) after one year (Cavigneaux & Cabasson, 1972; Kesson et al, 1977; He et al, 1989). Rats and hens exposed to 12, 25, or 50 mg/kg of acrylamide 3 times per week for 3 weeks developed ataxia (staggering gait). Both peripheral and central nervous system damage were seen in rats, while hens developed only peripheral nerve lesions (Jortner & Ehrich, 1993).

In a two year study in rats where acrylamide was administered in the drinking water, an increased incidence of scrotal

11 . Toxicological information

mesotheliomas (a rare abnormal increase in tissue growth in the scrotum), central nervous system tumors, thyroid tumors and tumors at other sites were described.

Acrylamide has been reported to be genotoxic in many test systems. Acrylamide inhibited DNA synthesis in rat cells in vitro (RTECS, 1996). Acrylamide induced chromosome aberrations in mice in vivo, in mouse lymphocytes and hamster lung cells, and in cultured human lymphocytes (white blood cells) (RTECS, 1996; HSDB, 1996). Sister chromatid exchanges were seen in rats and mice in vivo, and in hamster lung cells (RTECS, 1996).

IARC has classified acrylamide as a Group 2A carcinogen [probable human carcinogen (human evidence is inadequate, animal evidence is sufficient)]. NTP has classified acrylamide as a suspect carcinogen, and OSHA has classified acrylamide as a Group 2A (possible select carcinogen), upgraded from a Group 2B, based on a study conducted in 1994. (LOLI)

12 . Ecological information

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
SpectraFloc™ 675 FLOCCULANT	Acute LC50 15.5 ppm	Fish - Fathead minnow	96 hours
	Acute LC50 1.7 ppm	Daphnia - Daphnia pulex	48 hours

Conclusion/Summary : Not available.

Biodegradability

Conclusion/Summary : Not available.

Additional information

An EcoTox™ Report, and/or the material's environmental fate is available upon request at the following number: 1-800-235-4249, then press 4.

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
DOT Classification	Not regulated.	-	-	-		-
TDG Classification	Not regulated.	-	-	-		-
IMDG Class	Not regulated.	-	-	-		-

14 . Transport information

PG* : Packing group

DOT Reportable Quantity Not applicable.

Marine pollutant Not applicable.

North-America NAERG : Not available.

15 . Regulatory information

HCS Classification : Irritating material
Carcinogen

U.S. Federal regulations : **United States inventory (TSCA 8b)**: All components are listed or exempted.
TSCA 12(b) annual export notification: Acrylamide

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: Petroleum distillates
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: SpectraFloc™ 675 FLOCCULANT: Immediate (acute) health hazard, Delayed (chronic) health hazard

CERCLA: Hazardous substances.: Acrylamide: 5000 lbs. (2270 kg);
Clean Water Act (CWA) 307: No products were found.

Clean Water Act (CWA) 311: No products were found.

Clean Air Act (CAA) 112 accidental release prevention: No products were found.

Clean Air Act (CAA) 112 regulated flammable substances: No products were found.

Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs) : Not listed

SARA 313

	Product name	CAS number	Concentration
Supplier notification :	Acrylamide	79-06-1	0 - 0.1

United States inventory (TSCA 8b) : All components are listed or exempted.

Canada

WHMIS (Canada) : Class D-2A: Material causing other toxic effects (Very toxic).
Class D-2B: Material causing other toxic effects (Toxic).

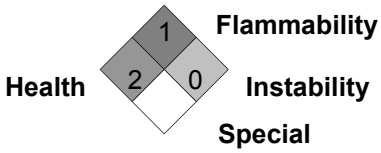
Canada (CEPA DSL): : All components are listed or exempted.

16 . Other information

Label requirements : INHALATION CAUSES HEADACHES, DIZZINESS, DROWSINESS AND NAUSEA AND MAY LEAD TO UNCONSCIOUSNESS. CAUSES RESPIRATORY TRACT AND EYE IRRITATION. MAY CAUSE SKIN IRRITATION. PROLONGED OR REPEATED CONTACT MAY DRY SKIN AND CAUSE IRRITATION. HARMFUL OR FATAL IF SWALLOWED. CAN ENTER LUNGS AND CAUSE DAMAGE. SUSPECT CANCER HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE CANCER. ASPIRATION HAZARD.

National Fire Protection Association (U.S.A.) :

16 . Other information



Date of printing : 12/30/2009.

◤ Indicates information that has changed from previously issued version.

Notice to reader

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.